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ABSTRACT

A study of the noun incorporation phenomenon in Korean suggests that noun incorporation occurs at D-structure and obeys the Head Movement Constraint syntactically, and the Theme-Only Constraint semantically. First, the structure of "sunrise"-type words is identified, showing that before derivation through nominalization of the affix "-i," compounding between the forms for "sun" and "to rise" should occur in the syntax. This fact is then used as direct evidence of noun incorporation, which is a word formation process in the syntax. Based on the structure identified, it is shown that every noun that goes through noun incorporation in the syntax must have the thematic role of "Theme." This observation is represented by the Theme-Only Constraint. Contains 14 references. (MSE)

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Constraints on Noun Incorporation in Korean

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Abstract: In this paper I discuss noun incorporation phenomena in Korean. I will show that noun incorporation of Korean occurs at D-structure and obeys the Head Movement Constraint (HMC) by Travis (1984) and Chomsky (1986) syntactically and the Theme-Only Constraint semantically. For the discussion, I will first identify the structure of 'hæ-tot-i' *sunrise*-type words, showing that before derivation through attachment of the nominalizing affix '-i', compounding between 'hæ' *sun* and 'tot' *to rise* should occur in the syntax. This fact will then be used as direct evidence of noun incorporation, which is a word formation process in the syntax. Based on the structure identified, I will show that every noun which goes through noun incorporation in the syntax should have the thematic role of *Theme*. This observation is represented by the Theme-Only Constraint.

0. Introduction

Korean has many words with the structure [N + V_{STEM} + A_N (-i)]. The following are some examples of such words.

(1) a. hæ-tot-i
sun-rise-A_N [1]
'sunrise'

b. mul-pat-i
water-receive-A_N
'(a) gutter'

c. haru-sal-i
a day-live-A_N
'(a) dayfly'

d. kutu-tak-i
shoe-shine-A_N
'shoe-shine boy'

e. koki-cap-i
fish-catch-A_N
'fishing'

f. kamok-sal-i
prison-live-A_N
'living-in-prison'

For convenience's sake, let's call the words in (1) 'hæ-tot-i' *sunrise* type words. Concerning the formation process of such words, there might be two analyses such as [[N+V_{STEM}] + A_N(-i)] and [N+ [V_{STEM}+A_N(-i)]]. In this paper, I will first show which analysis of the two is more plausible and then, based on the confirmed process of word formation of 'hæ-tot-i' *sunrise* type words, I will discuss the main concerns of this paper such as noun incorporation in Korean, and syntactic and semantic constraints which restrict Noun incorporation.

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1. Incorporation Structure

As illustrated above, the possible structures for 'hæ-tot-i' *sunrise* type words are as follows:

(2) a. $[[N + V_{STEM}] + A_N(-i)]$

b. $[N + [V_{STEM} + A_N(-i)]]$

(2a) shows that compounding between a noun and a verb occurs before the addition of a nominalizing affix, while in (2b) compounding occurs after derivation. The reason why both structures have been controversially assumed for 'hæ-tot-i' *sunrise* type words is because neither the structure $[N+V_{STEM}]_V$ of 'hæ-tot-i' *sunrise* type words, such as 'hæ-tot', 'mul-pat', 'haru-sal', etc., in (1) nor the structure $[V_{STEM}+A_N(-i)]_N$ of that type of words such as 'tot-i', 'sal-i', 'cap-i', and 'pat-i', etc. is used as an independent word[2] in Modern Korean. For this reason, some have assumed (2a), while others (2b). In this paper, I will argue that the structure in (2a) is correct. In order to approve the structure in (2a), let's consider what problems (2b) has.

The reason some linguists accept the (2b) structure is as follows. First, even though Korean has no compounds with the structure [N+V], or the structure $[V+A_N(-i)]_N$ such as $[sal+-i]_N$, nominals with the structure (2b) are observed more frequently than those with the structure (2a) being used to combine with other nominals in word formation. That is, although word forms such as 'sal-i' *living* and 'cap-i' *capture* are not used as an independent word[3], they frequently can combine with other nouns to form a bigger compound. (3) and (4) show some more examples of this usage.

(3) a. məsɨm-sal-i,
farmhand-live-A_N
'living as a farmhand'

b. kwiyaŋ-sal-i
exile-live-A_N
'living in exile'

c. ok-sal-i
prison-live-A_N
'living in a prison'

d. çəka-sal-i
wife's home-live- A_N
'living in a wife's home'

e. haru-sal-i
a day-live-A_N
'(a) dayfly'

(4) a. mal-cap-i
mal[4]-catch-A_N
'a person who measures grain by *mal*'

b. param-cap-i
wind-catch-A_N
'(a) cheerleader(person)'

c. son-cap-i
hand-catch- A_N
'(a) handle'

d. kal-cap-i
sword-catch-A_N
'(a) swordsman'

Let's consider the characteristics of 'sal-i' *living* and 'cap-i' *catching* in (3) and (4) in more detail.

Lee (1965) analyzes words in (3) and (4) as compound nouns, considering 'sal-i' *living* and 'cap-i' *catching* as nouns. If he is correct, then it means that 'sal-i' *living* and 'cap-i' *catching* are derived nominals produced by addition of the nominalizing affix '-i'. And both of them, 'sal-i' and 'cap-i', should be able to form bigger derivatives or compounds by combining with other nominalizing affixes or nouns or should be able to appear independently such as the examples in (5) and (6). However, the data in (7)-(8) show that this is not the case.

(5) a. $[[mol]_V + [-i]A_N]_N$
chase A_N
'chasing'

b. $[[pul]_V + [-i]A_N]_N$
solve A_N
'solving'

c. $[[nol]_V + [-i]A_N]_N$
play A_N
'playing'

(6) a. $[[mol\text{-}i]_N + [k'un]A_N]_N$[5]
chase-A_N+A_N('person')
'(a) chaser'

b. $[[mol\text{-}i]_N + [pæ]A_N]_N$
chase-A_N+ship
'(a) chasing boat'

c. $[[pul\text{-}i]_N + [ran]_N]_N$
solve-A_N + column
'(an) explanation column'

d. $[[nol\text{-}i]_N + [madaŋ]_N]_N$
play-A_N + field
'(a) playground'

(7) a. *sal-i, *cap-i, *pat-i, *kəl-i,
live-A_N catch-A_N receive-A_N walk-A_N

b. *cu-i, *k'ak-i *pal-i *mil-i
give-A_N cut-A_N sell-A_N push-A_N

(8) a.* $[[sal\text{-}i]_N + [k'un]A_N]_N$
live-A_N + A_N('person')

b.* $[[sal\text{-}i]_N + [pæ]A_N]_N$
live-A_N+ship

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c.* $[[cap\text{-}i]_N + [ran]_N]_N$ — catch-A_N + column

d.* $[[cap\text{-}i]_N + [madaŋ]_N]_N$ — catch-A_N + field

Unlike the examples in (5-6), word forms such as 'sal-i' and 'cap-i' can not easily combine with others to form bigger derivatives or compounds, nor can they be used independently as we see in (7-8).

Based on the observations above, we can say that in the 'hæ-tot-i' *sunrise* type words with $[N+V_{STEM}+A_N$ (-i)] structure as we see in (1), (7) and (8), 'tot-i' cannot be said to be a derived nominal. That is, the V_{STEM} and the A_N(-i) don't combine to form a derived nominal in the 'hæ-tot-i' *sunrise* type words.

What would it be to analyze the word type 'tot-i' *to rise* not as a nominal but as an affix? Such an analysis will bring about the following problems. First, there is no case in Korean in which the combination ,'V_{STEM} +$Affix_N$(-i)', becomes an affix. Therefore, though the combination, 'V_{STEM} +$Affix_N$(-i)' could be hyper-correctionally considered as an affix, the original structure should be $[[N+V_{STEM}]+A_N$(-i)], which is represented as (2a).

Second, if the word type of 'tot-i' *to rise*, that is, 'V_{STEM} +$Affix_N$(-i)', were an affix and were used to show the same distribution in many nominals, then, words which belong to such a word type should be considered to have the same meaning wherever they appear. If we consider the slightest meaning of each of them as they appear in bigger derived nominals in more detail, however, we cannot say that the meaning is the same. Let's take 'sal-i' and 'cap-i' as examples.

(9) a. çəga-sal-i[6] : /sal/ --> 'to live or stay'
wife's home-live-A_N
'living in a wife's home'

b. haru-sal-i : /sal/ --> 'to manage or extend life'
a day-live-A_N
'(a) dayfly'

c. məsum-sal-i : /sal/ --> 'to do a role of a farmhand'
farmhand-live-A_N /-i/ --> 'the action of catching fish'
'living as a farmhand'

(10) a. puk-cap-i : /cap/ --> 'to grasp with hands,
drum-catch-A_N /-i/ --> 'a person who catches (something)'
'(a) drummer'

b. koki-cap-i : /cap/ --> 'to catch or capture'
fish-catch-A_N /-i/ --> 'the action of catching something'
'fishing'

c. son-cap-i : /cap/ --> 'to grasp or catch'
hand-grasp-A_N /-i/ --> 'something grasped by hands'
'(a) handle'

As we see in (9) and (10), 'sal-i' and 'cap-i', which belong to the same word type, are different in their meaning according to the environment which they are in. Therefore, based on the facts we discussed, we cannot deal with them as an affix. Instead, we can explain the difference of meaning when we assume the structure of $[[N+V_{STEM}]+ -i]$.

This analysis can be supported by considering the historical development of the affix $[caŋ\text{-}i]_N$, 'an artisan'.[7] 'caŋ-i' is a diachronically developed affix which has been formed by addition of '-i', an affix indicating 'a person' in this case, to the Chinese word 'caŋ' which represents *an artisan, a craftsman or a person who has an excellent skill or technique in certain areas such as art, handicraft, etc.* The fact that 'caŋ-i' is not an independent word in Modern Korean like 'sal-i' and 'cap-i' and that 'çil-caŋ' has its full meaning even without the affix '-i' indicates that 'çil-caŋ-i' has experienced change of affixation from $[[[çil]_N+[caŋ]_N]_N + [\text{-}i]_{Affix}]_N$ to $[[çil]_N+[[caŋ]_N+[\text{-}i]_{Affix}]_N]_N$.[8]

2. Syntactic Formation of the '[hæ-tot-]' *to sunrise* type compounds

In the previous sections, we discussed that 'hæ-tot-i' *sunrise* type words should be understood to have gone through the formation process of $[[hæ\text{-}tot]_V+[\text{-}i]_{Affix}]_N$. Now, the remaining question will be about the procedure of formation of [hæ-tot-]$_V$ *to sunrise*, that is, to reveal how and where such type of verb compounds is formed.

First of all, I will assume that 'hætot-' *to sunrise* type compounds are not a lexical compound but a syntactic compound. One argument for this point of view is that syntactically corresponding sentential - or IP - structures to the 'hætot-' *to sunrise* type compounds are easily available. Another argument is that syntactic affixes, that is, Case suffixes, can be freely inserted between the two morphemes of such verb compounds. Consider the following comparison;

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(11) Compounds Corresponding Sentences

a. [hæ-tot-i]$_N$ <---> [hæ-ka tot-ta]$_{IP}$
sun-rise-A$_N$ sun-NOM rise-DECL
'sunrise' 'The sun rises.'

b. [mul-pat-i]$_N$ <---> [mul-ɨl pat-ta]$_{IP}$
water-receive-A$_N$ water-ACC receive-DECL
'gutter' 'pro receive(s) water.'

c. [kamok-sal-i]$_N$ <---> [kamok-ɨl sal-ta]$_{IP}$
prison-live-A$_N$ kamok-ACC live-DECL
'living-in-the-prison' 'pro serve(s) a prison term.'

d. [koki-cap-i]$_N$ <---> [koki-rɨl cap-ta]$_{IP}$
fish-catch-A$_N$ fish-ACC catch-DECL
'fishing' 'pro catch(es) fish.'

e. [kutu-tak-i]$_N$ <---> [kutu-rɨl tak-ta]$_{IP}$
shoe-shine-A$_N$ shoe-ACC shine-DECL
'(a) shoeshine person' 'pro shine(s) shoes.'

We can observe that 'hætot-' *to sunrise* type compounds can be easily converted into another bigger syntactic structure of IP by inserting some Case suffixes. (11a) shows the relation between Subject - unaccusative verbs and (11b-e) show the relation between Object - transitive verbs.[9] Thus, based on the evidence observed above, we can say that 'hætot-' type compounds are a syntactic compound[10], not a lexical one.

3. Syntactic Constraint of Noun Incorporation

Now, let's consider the main concern of this paper. The facts that in 'hæ-tot-i' *sunrise* type words, the noun 'hæ' *sun* and the verb 'tot' *to rise* should combine with each other before the nominalizing affix '-i' is attached to the verb, and that such compounding can be analyzed as a syntactic process suggest that there might be Noun incorporation processes in Korean which can be explained syntactically.[11] I assume that a noun, head of the preceding NP, moves to the head of the following VP to form a syntactic compound. Mithun (1984) and Baker (1985, 1988) understand this kind of head movement as noun incorporation in which a noun incorporates into a verb. Mithun (1984)'s Noun incorporation can be summarized as follows:

(12) a. A noun stem functioning as Subject combines with an intransitive verb to form a new intransitive verb.

b. A noun stem functioning as Object combines with a transitive verb to form a new intransitive verb.

(12) says that in Noun incorporation in Korean, the preceding noun plays a role of 'stem' morphologically in combining with the following verb, producing a new compound. (12a) results from combining the noun in the Subject position with the following verb, and (12b) is for the case in which the noun in the Object position moves to the following verb. Under the Head-Movement hypothesis based on the noun incorporation of (12), we can have the following structures.

(13) a. $[[[hæ]_N]_{NP}$ $[[tot]_V]_{VP}$ ta[12] ---> $[[[\ t_i\ ]_N]_{NP}$ $[hæ_i+tot]_V]_{V'}$ ta
'sun' 'rise' DECL

b. $[[[mul]_N]_{NP}$ $[pat]_V]_{V'}$ ta ---> $[[[\ ti\ ]_N]_{NP}$ $[mul_i+pat]_V]_{V'}$ ta
'water' 'receive' DECL

c. $[[[kamok]_N]_{NP}$ $[sal]_V]_{V'}$ ta ---> $[[[\ t_i\ ]_N]_{NP}$ $[kamok_i+sal\ ]_V]_{V'}$ ta
'prison' 'live' DECL

d. $[[[koki]_N]_{NP}$ $[cap]_V]_{V'}$ ta ---> $[[[\ t_i\ ]_N]_{NP}$ $[koki_i+cap\ ]_V]_{V'}$ ta
'fish' 'catch' DECL

e. $[[[kutu]_N]_{NP}$ $[tak]_V]_{V'}$ ta ---> $[[[\ t_i\ ]_N]_{NP}$ $[kutu_i+tak]_V]_{V'}$ ta
'shoe' 'shine' DECL

(13a) indicates that 'hæ' *sun* which is the head of an NP in the thematic Subject position[13] under the VP, moves to the immediately following verb, and (13b-e) show that heads of the NP's in the Object position, such as 'mul' *water*, 'kamok' *prison*, 'koki' *fish*, and 'kutu' *shoe* respectively, move to immediately following verbs.

Head-Movement requires adjacency. That is, a noun, head of NP, and a verb, head of VP, should be adjacent to each other in order for the verb to govern its preceding NP-trace. All movements in (13) are licensed: they observe the adjacency condition, that is, all NP-traces are governed by the following verbs.

When a noun moves to an adjacent verb while observing the adjacency condition, let's assume that it produces a left-branching structure. Consider (14);

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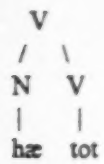
(14) a. $[[hæ]_N+[tot]_V]_V$

b.


Now, based on the assumptions we have discussed so far, we can show the procedure of head movement for noun incorporation in Korean as follows;

(15) a. Head Movement from Subject Noun to Verb

b Head Movement from Object Noun to Verb

If we accept the Unaccusative Hypothesis, then we can unify (a) structure into (b) structure because in the (a) structure, Subject is actually originated as an internal argument of an Unaccusative verb, that is, a *Theme*.
In the structures of (15), the preceding noun and the following verb are adjacent to each other, and the verb governs the noun. Compare (15) structure with the following (16) structure in which another head intervenes between a noun and a verb.

(16) a. cəlsu-nɨn pab-ɨl mani məkɨn -ta.
cəlsu-NOM rice-ACC much eat -Pres. -DECL
'Cəlsu eats rice much.'

b.* cəlsu-nɨn $[_{VP}\ [_{NP}\ t_i\ ]\ [_{V'}\ [_{ADVP}$ mani $]\ \ [pab_i + mək]_V\ ]]$ -nɨn -ta.

(16) shows that when the adjacency condition is violated, noun incorporation in Korean is not allowed. Thus, we can say that the movement of noun incorporation should obey the following Head-Movement Constraint (Chomsky 1986, Travis 1984).

(17) Head Movement Constraint (HMC)

Movement of a zero-level category β is restricted to the position of a head α that governs the maximal projection γ of β, where α θ-governs or L-marks γ if $\alpha \neq C$.

4. Semantic Constraint of Noun Incorporation

In this section, we will discuss a semantic constraint which regulates noun incorporation in Korean. Though we have revealed the procedure of noun incorporation in Korean as syntactic, still some questions remain: first, is head movement for noun incorporation possible in every sentence with the structure of (15)? Second, why does a noun move to a verb, playing a role of a STEM?

The clue to the answers can be obtained from the thematic relation between a verb and its preceding noun. That is, in the noun incorporation structure, a noun is very closely related with one of the possible thematic roles that a verb can have. Consider the following sentences of (18) again. ((18) is a repeat of (13));

(18)[14]a. $[hæ]_{NP}$ $[tot]_{VP}$ -ta ---> $[t_i]_{NP}$ $[hæ_i+tot]_V$ -ta
'sun' 'rise' DECL
Theme

b. $[mul]_{NP}$ $[pat]_V$ -ta ---> $[t_i]_{NP}$ $[mul_i+pat]_V$ -ta
'water' 'receive' DECL
Theme

c. $[kamok]_{NP}$ $[sal]_V$ -ta ---> $[t_i]_{NP}$ $[kamok_i+sal]_V$ -ta
'prison' 'live' DECL
Theme

d. $[koki]_{NP}$ $[cap]_V$ -ta ---> $[t_i]_{NP}$ $[koki_i+cap]_V$ -ta
'fish' 'catch' DECL
Theme

e. $[kutu]_{NP}$ $[tak]_V$ -ta ---> $[t_i]_{NP}$ $[kutu_i+tak]_V$ -ta
'shoe' 'shine' DECL
Theme

All nouns in (18) move- that is, incorporate- into verbs. In this case, all nouns have the thematic role of '*theme*'.

What would it be when nouns have other thematic roles than *Theme*? Consider the following in which nouns have thematic roles other than *Theme*:

(19) a. Tɑm-i kaki-ka hɨmdɨl -ta
Tom-NOM go-NOM be-difficult -DECL
Agent
'It is difficult for Tom to go.'
a'* [t_i] [[Tom $_i$+ka]$_V$ +ki]$_N$ -ka himdɨl-ta

b. totɨk-i sunkyəŋ-eke cap -hi -ət -ta
thief-NOM policeman -'by' catch -Passive -Past -DECL
Agent
'A thief was caught by a policeman.'
b'* totɨk-i [t_i] [sunkiəŋ $_i$+cap]$_V$ -hi -ət -ta.

c. Bill-ɨn cip-e itki-rɨl siləhan -ta.
Bill-NOM house-'at' staying-Acc dislike -DECL
Locative
'Bill dislikes staying at home.'
c'*Bill-ɨn [t_i] [[cip$_i$+it]$_V$ +ki]$_N$ -rɨl siləhan -ta.

d. Bill-ɨn cip-e kaki-rɨl siləhan -ta.
Bill-NOM house-'to' going-Acc dislike -DECL
Goal
'Bill dislikes going home.'
d'* Bill-ɨn [t_i] [[cip$_i$+ka]$_V$ +ki]$_N$-rɨl siləhan -ta.

e. nakta-nɨn arabia-esə wa -t -ta.
camel-NOM Arabia -'from' come -Past -DECL
Source
'Camels came from Arabia.'
e' * nakta-nɨn [t_i] [arabia $_i$+wa]$_V$ - t -ta.

f. Mary-nin pam-e on-ta
Mary-NOM night-'in' come -DECL
Time
'Mary comes at night.'
f'.* Mary-nin [t_i] [pam$_i$+on]$_V$ -ta

(20) a. Tom-in Nun-i næri-ki-ril kitæhan-ta
Tom-NOM snow-NOM fall+ing-ACC want -DECL
Theme
'Tom wants snow to fall.'

a'. Tom-in [t_i] [[nun$_i$ +næri]$_V$+ki]$_N$-ril kitæhan-ta.

In (19), thematic roles of adjacent NP's are 'Agent', 'Locative', 'Goal', 'Source' and 'Time' respectively. And none of the heads of NP's in (19) can move to adjacent heads of VP's. Though the structures of (19) are the same as those of (15), and though they obey HMC of (16), movement of nouns to the following verb position results in at best marginal or ungrammatical sentences. On the other hand, in (20), movement of a head of an adjacent NP to the following verb position is allowed as it is in (18). The difference between the (18) and (19) sentences is just from the difference of thematic roles: *+Theme* in (18) and (20), while *–Theme* in (19). Therefore, we can conclude that head movement of a Noun to a Verb in Korean should obey the following semantic constraint:

(21) *Theme*-Only Condition (Semantic Constraint of Noun incorporation in Korean)

N can move into an adjacent V for semantic conjunction iff the θ-role of N, a syntactic head, is a *Theme*.

5. Conclusion

We have discussed the structure of 'hæ-tot-i' type compounds, Noun incorporation in Korean which can be considered as a word formation process in the syntax, and syntactic and semantic constraints regulating noun incorporation. For a syntactic constraint restricting noun incorporation in Korean, I have argued that noun incorporation in Korean must obey the Head Movement Constraint suggested by Chomsky (1986) and Travis (1984). Concerning a semantic constraint for noun incorporation, we have revealed that only nouns with the

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thematic role of *Theme* can go through noun incorporation in Korean, which is formally expressed in (18).

NOTES

1. "A_N" indicates the Nominalizing Affix.

2. Unlike the words such as 'tot-i', 'sal-i', 'cap-i', and 'pat-i' which have the structure of $[V_{STEM}+A_N\ (-i)]_N$, the following $[V_{STEM}+A_N\ (-i)]_N$ words such as 'mol-i' *chasing*, 'pul-i' *solving*, and 'nol-i' *play(ing)* appear independently. That means that when they combine with other nominals to form bigger compounds, the structure will be different from that of 'tot-i', 'sal-i', 'cap-i', and 'pat-i'. A detailed structure is shown below.

(a) $[[sasim]_N+[[mol]_V+[-i]A_N]]_N$
deer chase A_N
'deer-chasing'

(b) $[[muncæ]_N+[[pul]_V+[-i]A_N]]_N$
problem solve A_N
'problem-solving'

3. Generally speaking, when we say that a word is an independent word, it means that the word is listed in the lexicon. In this paper, I accept this point of view. However, to be more detailed, this point of view should not be completely plausible, since new words are continuously being formed, and are accepted as a word by the acknowledgement of the public.

4. A measure containing about 18 liters.

5. The nominalizing affix [-k'un], *a skillful person* can be attached to any nominals in (5) to form bigger derivatives, all of which are acceptable such as the following:

(a) mol-i-k'un *a skillful chaser*
(b) pul-i-k'un *an excellent problem-solver*
(c) nol-i-k'un *an excellent cheerleader or amuser who has a great talent for amusing others*

6. All '/-i/'s in (7) seems to express the same meaning of 'an action or behavior'. On the other hand, the '/-i/'s in (8) are all different from each other in their meaning. This fact will support my argumentation. The slightest difference of meaning of each verb stem in (7) and (8) has been identified by *The Great*

Korean Dictionary published by Keumseong Textbook Publishing Company(1994), Seoul, Korea.

7. We can find many words with the affix '-caŋi' in Korean.
   a. simsul-caŋi : 'a pervasive/contrary/cursed child(person)'
   b. yoksim-caŋi : 'a grasping/grabby/greedy fellow'
   c. yok-caŋi : 'a foul-mouthed/foul-tongued fellow'
   d. s'aum-caŋi : 'a quarrelsome/contentious person'
   e. mals'əŋ-caŋi : 'a troublemaker'

8. In actuality, we have much evidence which can confirm the independent usage of 'hætot-' type words in written documents of the Middle Ages. However, to consider the data in more detail will be beyond of the purpose of this paper. So I will skip more detailed discussion here..

9. In Korean, syntactic compounds do not involve the relation between Subject-transitive verbs , nor between Object-intransitive verbs.

10. Abney (1986, 1987) also maintains that NP has the same structure as IP which can be observed from the following parallel thematic relation between NP and its corresponding IP. Consider;

(1) a. Caesar destroyed the city
    b. Caesar's destruction of the sity

(2) b. DP
       / \
    Spec D'
       / \
      D NP
        / \
       N (XP)

a. IP
   / \
Spec I'
   / \
  I VP
    / \
   V (XP)

11. Halle & Marantz (1993) suggests the following four as operations for word formation in syntax, (a) head movement and adjunction, (b) merger, (c) fusion, and (d) morpheme fission.

Mithun (1984) and Baker (1985, 1988) also explain Noun Incorporation as a head movement phenomenon. That is, they maintain that head movement is not

only for inflectional morphology such as the movement from V to I and to C, but it can also be extended to the movement from N to V.

12. `-ta' is a declarative marker which is located in [INFL, IP]. In actuality, this marker '-ta' does not have any relation with the discussion in this section. Thus, I will just ignore it here.

13. Noun Incorporation should occur before any other movement or before Case assignment. Or we have to assume another device /procedure for syntactically realized Case elimination. Here I assume the VP-internal Subject Hypothesis.

14. Recall that all movements for Noun Incorporation must occur between D- and S-structure.

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